Indoor Vertical Farming Potential Solution to Long-Term Global Food Security Issues

CENTER FOR ANTICIPATORY INTELLIGENCE

Introduction

- **As global populations rise, climate change impacts increase, and additional threats emerge, society will need to turn to new methods of agricultural production to ensure long-term global food security. One such solution is Indoor Vertical Farming, the practice of cultivating produce or other agricultural products in stacked units within an enclosed, controlled environment.**

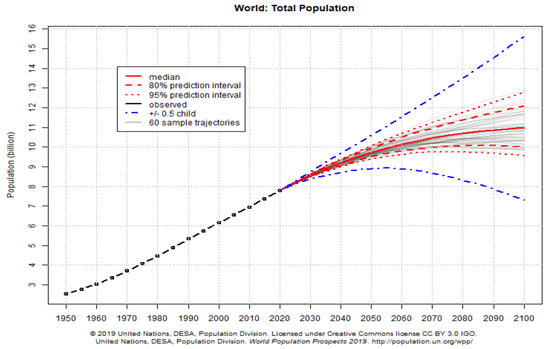

Figure 1: An example of a threat to global food security is rapid population growth (United Nations, 2019)

Methods

Research was collected through a variety of diverse sources, from government and industry reports to personal interviews.

1. A significant portion of research was conducted through one-on-one interviews with academic experts and industry leaders, such as Gotham Greens and Bowery Farming (major vertical farming companies).
2. Both the assessment of current and future potential threats to traditional agriculture/global food systems and investigation into the validity of vertical farming as a mitigation technique were investigated through threat assessment frameworks and resilience modeling learned through the USU CAI program, such as the 4R Framework.

- **Resistance**
- **Recovery**
- **Retention**
- **Resurgence**

Figure 2: An example of a large-scale vertical farm (A Beginner's Guide to Indoor Vertical Farming, 2017)

UtahStateUniversity

Study was conducted through a research question-driven approach. This project intentionally began without a hypothesis, with the goal of instigating deep research to identify the most significant areas for threat assessment of global food systems and indoor vertical farming as a mitigation technique.

Figure 3: BetaHatch is an indoor vertical farming company that produces alternative agricultural products, insects, for protein (BetaHatch, 2018).

Results, Conclusions

Indoor Vertical Farming does have the potential to alleviate global food security struggles, however, it must be conducted in tandem with traditional production methods.

- **Impacts**: Reduction of water, soil, and nutrition limitations. Provision of reliable, secure food no matter external situation.
- **Limitations:** Limited product types, costly high-tech infrastructure investment requirements, energy cost and source limitations.
- **Potential Resolutions of Limitations**: Genetic Engineering (to expand product types), Investment, Infrastructure Development, Additional Research.

Natalie Rigby
Undergraduate Student
Utah State University
Department of Environment and Society
natalie.s.rigby@gmail.com

Faculty Mentors:

Jeannie Johnson, Utah State University, Political Science & Anticipatory Intelligence

Briana Bowen, Utah State University, Political Science & Anticipatory Intelligence